

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 March 2005 (17.03.2005)

PCT

(10) International Publication Number
WO 2005/023403 A1

(51) International Patent Classification⁷: **B01D 71/02,**
69/12

Bong-Kuk [KR/KR]; 103-1005 Hanbit Apt., Eoeun-dong,
Yuseong-gu, Daejeon 305-755 (KR).

(21) International Application Number:
PCT/KR2004/002238

(74) Agent: **PAIK, Nam-Hoon**; 14th Fl., KTB Network Bldg.
826-14, Yeoksam-dong, Kangnam-ku, Seoul 135-769
(KR).

(22) International Filing Date:
3 September 2004 (03.09.2004)

(81) Designated States (*unless otherwise indicated, for every
kind of national protection available*): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:
10-2003-0061810
4 September 2003 (04.09.2003) KR

(84) Designated States (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): **KO-
REA RESEARCH INSTITUTE OF CHEMICAL
TECHNOLOGY** [KR/KR]; 100 Jang-dong, Yuseong-gu,
Daejeon 305-343 (KR).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **LEE, Kew-Ho**
[KR/KR]; 133-205 Hanbit Apt., Eoeun-dong, Yuseong-gu,
Daejeon 305-333 (KR). **LEE, Yoon-Kyu** [KR/KR]; 2-402
Kyungseong Mansion, Hongdo-dong, Dong-gu, Daejeon
300-190 (KR). **LEE, Dong-Wook** [KR/KR]; 602-16
Jung-dong, Suseong-gu, Daegu 706-050 (KR). **SEA,**

Published:

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: **TITANIA COMPOSITE MEMBRANE FOR WATER/ALCOHOL SEPARATION, AND PREPARATION THEREOF**

(57) **Abstract:** The present invention relates to a titania composite membrane for separating water/alcohol mixtures and a method of preparation thereof, and more particularly to the titania composite membrane and the method of preparation thereof, wherein a surface of a porous support is modified with silica xerogel and γ -alumina sol and titania sol is coated on the modified surface to form a titania surface layer and then the obtained titania surface layer is dried and calcined to optimize performance of separation and promote thermal stability. The titania composite membrane of the present invention has excellent properties such as thermal stability, mechanical strength and good perm-selectivity for water molecule in water/alcohol mixtures due to the hydrophilic property of the titania surface layer, thus being applicable to the membrane for separating water/alcohol mixtures.

WO 2005/023403 A1